CLAIMS

What is claimed is:

1. A method of providing parameters for decomposing images from first and second energy images acquired from a digital radiography imaging system, comprising the acts of:

identifying energy levels of the first and second energy images;

identifying a patient size of a patient being imaged by the digital radiography imaging system;

identifying a filtration setting of a collimator for the digital radiography imaging system;

obtaining a default decomposition parameter for the energy levels of the first and second energy images; and

automatically providing a soft tissue decomposition parameter and a bone decomposition parameter by modifying the default decomposition parameter based on the patient size and the filtration setting.

2. The method of claim 1, wherein the act of identifying the energy levels comprises the acts of:

identifying a low-energy level for the first energy image; and

identifying a high-energy level for the second energy image.

3. The method of claim 1, wherein the act of identifying the patient size comprises the act of identifying a size category for the patient.

4. The method of claim 3, wherein the act of identifying the patient size comprises the act of selecting a patient size offset factor based on the size category.

5.   The method of claim 1, wherein the act of identifying the filtration setting comprises the act of selecting a filtration offset factor based on the filtration setting.

6.   The method of claim 1, wherein the act of obtaining the default decomposition parameter comprises the act of selecting the default decomposition parameter from a parameter table comprising a plurality of default decomposition parameters, each corresponding to a low-energy level of the first energy image and to a high-energy level of the second energy image.

7.   The method of claim 1, comprising the act of evaluating the energy levels against energy range restrictions.

8.   The method of claim 7, wherein the act of automatically providing the soft tissue and bone decomposition parameters is performed only if the energy levels are within the energy range restrictions.

9.   The method of claim 1, comprising the acts of:

decomposing the soft tissue and bone images based on the soft tissue and bone decomposition parameters;

modifying at least one parameter of the soft tissue and bone decomposition parameters to improve image clarity of at least one image of the soft tissue and bone images interactively; and

automatically modifying at least one system default based on modifications to the at least one parameter.

10.   The method of claim 9, wherein the act of modifying at least one parameter comprises the act of interactively improving the at least one image by modifying the at least one parameter using a sliding scale.

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11.   The method of claim 9, wherein the act of automatically modifying the at least one system default comprises modifying a system configuration file comprising system parameters.

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12.   The method of claim 9, wherein the act of automatically modifying the at least one system default comprises modifying a default decomposition parameter table for the default decomposition parameter.

10   13.   The method of claim 9, wherein the act of automatically modifying the at least one system default comprises modifying a patient size offset factor for the patient size.

14.   The method of claim 9, wherein the act of automatically modifying the at least one system default comprises modifying a filtration offset factor for the filtration

15   setting.

15.   A method of decomposing soft tissue and bone images from low and high-energy images acquired by a digital radiography imaging system, comprising the acts of:
        obtaining the low and high-energy images for a desired anatomy of a patient;
20   identifying a patient size of the patient;
        identifying a filtration setting for the digital radiography imaging system;
        obtaining a default decomposition parameter;
        automatically providing a soft tissue decomposition parameter and a bone decomposition parameter by modifying the default decomposition parameter based on the
25   patient size and the filtration setting; and
        decomposing the soft tissue and bone images from the low and high-energy images based on the soft tissue and bone decomposition parameters.

16.   The method of claim 15, wherein the act of obtaining the low and high-energy images for the desired anatomy comprises the act of obtaining low and high-energy chest images.

5   17.   The method of claim 15, wherein the act of obtaining the default decomposition parameter comprises the acts of:

identifying a low-energy level for the first energy image;

identifying a high-energy level for the second energy image; man

selecting the default decomposition parameter based on both the low and high-

10   energy levels.

18.   The method of claim 15, wherein the act of identifying the patient size comprises the act of identifying a size category for the patient.

15   19.   The method of claim 18, wherein the act of identifying the patient size comprises the act of selecting a patient size offset factor based on the size category.

20.   The method of claim 15, wherein the act of identifying the filtration setting comprises the act of selecting a filtration offset factor based on the filtration setting.

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21.   The method of claim 15, wherein the act of obtaining the default decomposition parameter comprises the act of selecting the default decomposition parameter from a parameter table comprising a plurality of default decomposition parameters, each corresponding to a low-energy level of the first energy image and to a

25   high-energy level of the second energy image.

22.   The method of claim 15, comprising the acts of:

modifying at least one parameter of the soft tissue and bone decomposition parameters to improve image clarity of at least one image of the soft tissue and bone images interactively; and

5   automatically modifying at least one system default based on modifications to the at least one parameter.

23.   The method of claim 22, wherein the act of modifying at least one parameter comprises the act of interactively improving the at least one image by modifying the at least

10   one parameter using a sliding scale.

24.   The method of claim 22, wherein the act of automatically modifying the at least one system default comprises modifying a system configuration file comprising system parameters.

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25.   The method of claim 22, wherein the act of automatically modifying the at least one system default comprises modifying a default decomposition parameter table for the default decomposition parameter.

20   26.   A method of producing soft tissue and bone images of the desired anatomy of a patient, comprising the acts of:

acquiring low and high-energy images of the desired anatomy from a digital radiography imaging system using flat-panel detector technology;

identifying a patient size of the patient;

25   identifying a filtration setting for the digital radiography imaging system;

obtaining a default decomposition parameter based on energy levels of the low and high-energy images;

automatically providing a soft tissue decomposition parameter and a bone decomposition parameter by modifying the default decomposition parameter based on the patient size and the filtration setting; and

decomposing soft tissue and bone images of the desired anatomy from the low and high-energy images using the soft tissue and bone decomposition parameters to perform a log-subtraction dual-energy decomposition computation.

27.   The method of claim 26, wherein the act of acquiring the low and high-energy images of the desired anatomy comprises the act of acquiring low and high-energy chest images over a time interval.

28.   The method of claim 26, wherein the act of identifying the patient size comprises the act of identifying a size category for the patient.

29.   The method of claim 28, wherein the act of identifying the patient size comprises the act of selecting a patient size offset factor based on the size category.

30.   The method of claim 26, wherein the act of identifying the filtration setting comprises the act of selecting a filtration offset factor based on the filtration setting.

31.   The method of claim 26, wherein the act of obtaining the default decomposition parameter comprises the act of selecting the default decomposition parameter from a parameter table comprising a plurality of default decomposition parameters, each corresponding to a low-energy level of the first energy image and to a high-energy level of the second energy image.

32. The method of claim 26, comprising the acts of:

modifying at least one parameter of the soft tissue and bone decomposition parameters to improve image clarity of at least one image of the soft tissue and bone images interactively; and

automatically modifying at least one system default based on modifications to the at least one parameter.

33. The method of claim 32, wherein the act of modifying at least one parameter comprises the act of interactively improving the at least one image by modifying the at least one parameter using a sliding scale.

34. The method of claim 32, wherein the act of automatically modifying the at least one system default comprises modifying a system configuration file comprising system parameters.

35. The method of claim 32, wherein the act of automatically modifying the at least one system default comprises modifying a default decomposition parameter table for the default decomposition parameter.

36. A computer program for automatically providing decomposition parameters for decomposing soft tissue and bone images from low and high-energy images acquired from a digital radiography imaging system, comprising:

a tangible medium configured to support machine-readable code; and

machine-readable code supported on the medium and including:

a routine for obtaining a default decomposition parameter based on energy levels of the low and high-energy images; and

a routine for automatically providing a soft tissue decomposition parameter and a bone decomposition parameter by modifying the default decomposition

parameter based on a patient size and a filtration setting of the digital radiography imaging system.

37.   The computer program of claim 36, wherein the machine-readable code comprises a routine for identifying a size category for a patient being imaged by the digital radiography imaging system.

38.   The computer program of claim 36, wherein the routine for identifying the size category comprises a routine for selecting a patient size offset factor based on the size category.

39.   The computer program of claim 36, wherein the machine-readable code comprises a routine for selecting a filtration offset factor based on a filtration setting of the digital radiography imaging system.

40.   The computer program of claim 36, wherein the routine for obtaining the default decomposition parameter comprises a routine for selecting the default decomposition parameter from a parameter table comprising a plurality of default decomposition parameters, each corresponding to a low-energy level of the first energy image and to a high-energy level of the second energy image.

41.   The computer program of claim 36, wherein the machine-readable code comprises:

a decomposition routine for decomposing the soft tissue and bone images based on the soft tissue and bone decomposition parameters;

an image enhancement routine for modifying at least one parameter of the soft tissue and bone decomposition parameters to improve image clarity of at least one image of the soft tissue and bone images interactively; and

a system update routine for automatically modifying at least one system default based on modifications to the at least one parameter.

42.   The computer program of claim 41, wherein the image enhancement routine comprises an interactive slider mechanism adapted to interactively improve the at least one image by re-decomposing the at least one image using the modified at least one parameter.

43.   The computer program of claim 41, wherein the system update routine comprises a decomposition parameter modification routine for modifying a system configuration file comprising system parameters.

44.   The computer program of claim 41, wherein the system update routine comprises a default parameter modification routine for modifying a default decomposition parameter table for the default decomposition parameter.

45.   A medical imaging system, comprising:

a digital radiographic imaging system, comprising:

an x-ray device adapted to generate x-rays;

a collimator adapted to filter the x-rays in a desired anatomical region of a patient;

a flat-panel digital x-ray detector adapted to detect x-rays passing through the patient; and

dual-energy control circuitry adapted to acquire low and high-energy images of the desired anatomical region over a time interval; and

an image processing system, comprising:

an automatic decomposition parameter selection module adapted to compute soft tissue and bone decomposition parameters by

modifying a default decomposition parameter based on a patient size category and a filtration setting of the collimator; and

a dual-energy image decomposition module adapted to decompose soft tissue and bone images from the low and high-energy images based

5   on the soft tissue and bone decomposition parameters.

46.   The system of claim 45, wherein the image processing system comprises:

an image enhancement module adapted to modify at least one parameter of the soft tissue and bone decomposition parameters to improve image clarity of at least one image of

10   the soft tissue and bone images interactively; and

a system update module adapted to modify at least one system default based on modifications to the at least one parameter.

47.   The system of claim 46, wherein the system update module comprises a

15   default parameter modification correction module for modifying a default decomposition parameter table for the default decomposition parameter.

48.   A system for decomposing soft tissue and bone images from low and high-energy images acquired by a digital radiography imaging system, comprising means for

20   automatically providing a soft tissue decomposition parameter and a bone decomposition parameter based on a default decomposition parameter, a patient size, and a collimator filtration setting.

49.   The system of claim 48, comprising means for identifying a patient size

25   correction factor for a patient being imaged by the digital radiography imaging system.

50.   The system of claim 48, comprising means for identifying a filtration correction factor based on the collimator filtration setting of the digital radiography imaging system.

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51.   The system of claim 48, comprising means for obtaining a default decomposition parameter based on energy levels of the low and high energy images.

52.   The system of claim 48, comprising means for decomposing the soft tissue and bone images from the low and high-energy images.

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53.   The system of claim 48, comprising means for acquiring the low and high-energy images from the digital radiography imaging system.

54.   The system of claim 48, comprising means for interactively improving

15   image clarity of at least one image of the soft tissue and bone images by modifying at least one parameter of the soft tissue and bone decomposition parameters interactively.

55.   The system of claim 54, comprising means for automatically modifying at least one system default based on modifications to the at least one parameter.

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